U.S. Army Corps of Engineers
San Francisco District
South Pacific Division

The Resources Agency
of California

RUSSIAN RIVER WATERSHED

MANAGEMENT & PROTECTION STUDY

PROJECT STUDY PLAN

November 1998

RUSSIAN RIVER WATERSHED STUDY

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ACRONYMS

AE	Architectural and Engineering
CAP	Continuing Authorizes Program
CEQA	California Environmental Quality Act
Corps	Corps of Engineers
EPA	Environmental Protection Agency
FCSA	Feasibility Cost Sharing Agreement
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
HQUSACE	Headquarters, U.S. Army Corps of Engineers
HTRW	Hazardous, Toxic, and Radioactive Waste
IRC	Issue Resolution Conference
KRIS	Klamath Resource Information System
NED	National Economic Development
NEPA	National Environmental Policy Act
PCA	Project Cooperation Agreement
PSP	Project Control Plan
QCP	Quality Control Plan
RCD	Resource Conservation District
SACCR	Schedule and Cost Change Request
SPD	South Pacific Division
USACE	U.S. Army Corps of Engineers
WBS	Work Breakdown Structure
WRDA 86/96	Water Resource Development Act of 1986/1996

CHAPTER 1 - INTRODUCTION

1.1 SUMMARY

The Russian River Ecosystem Restoration Reconnaissance Report (September 1997) was authorization by Congress (September 28, 1994) *to review the effects of Coyote and Warm Springs Dam on the Russian River and its tributaries to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of environmental protection and restoration, erosion control and streambank protection, ground water supplies, and other purposes*. To fulfill this mission the Reconnaissance Report identified three project proposals that are in the Federal interest to develop further.

One of the proposals was the development of a watershed management ecosystem restoration study. Ecosystem management considers social, economic, and ecological watershed resource use and protection. This study will support a Russian River Watershed Council (Watershed Council) that will adopt and implement a Russian River watershed management plan, exploring a range of watershed restoration tasks.

Two other proposals were suggested in the Reconnaissance Report. The first, which is currently being developed, will restore a portion of Santa Rosa Creek to provide a significant long-term increase in habitat for several threatened and endangered species. The second proposal suggested revisions to the wet/dry regimes of Warm Springs and Coyote Dams. This proposal would have the potential to positively benefit the salmonid fisheries by changing the river's hydrology. Currently, a Section 7 formal consultation pursuant to the Endangered Species Act is being implemented. The Corps, the National Marine Fisheries, and the Sonoma County Water Agency have signed a join MOU to complete the Section 7 consultation.

Another federal activity, the Clean Water Action Plan, specified a process to develop a Unified Watershed Assessment (UWA) to guide allocation of new federal resources for watershed protection. Using three areas of importance - high value, high risk, and high opportunity - watersheds were prioritized. The Russian River watershed (Reference Number 18010110) was grouped in the highest category, Priority I (Impaired), by the State of California.

The watershed study will be completed in two phases. This Project Study Plan (PSP) outlines the Russian River Watershed Study. This PSP reflects the interest and the importance the community places in the restoration and protection of the Russian River watershed by their involvement in the creation of the Watershed Council. The Watershed Council is a 64 member body consisting of 4 broad groups with 16 members each. The groups are the environmental interest group, the economic interest group, the public interest group, and the agencies group. It was the general consensus that the agencies group would be non-voting members except for the Resource Conservation Districts (RCD), who are non-regulatory local agencies. Background

information on the development of the Watershed Council and the community's involvement in the development of the PSP is available at the Corps of Engineers web site at www.spn.usace.army.mil. As the study progresses, this PSP may be revised in concurrence with the Watershed Council's priorities and decisions to reflect the changes of scope. By the end of Phase I, this PSP will be revised as recommended by the Watershed Council to detail the scope of the remainder of the study. By the end of Phase II, the Watershed Council with technical and logistical support will complete the Russian River watershed management plan.

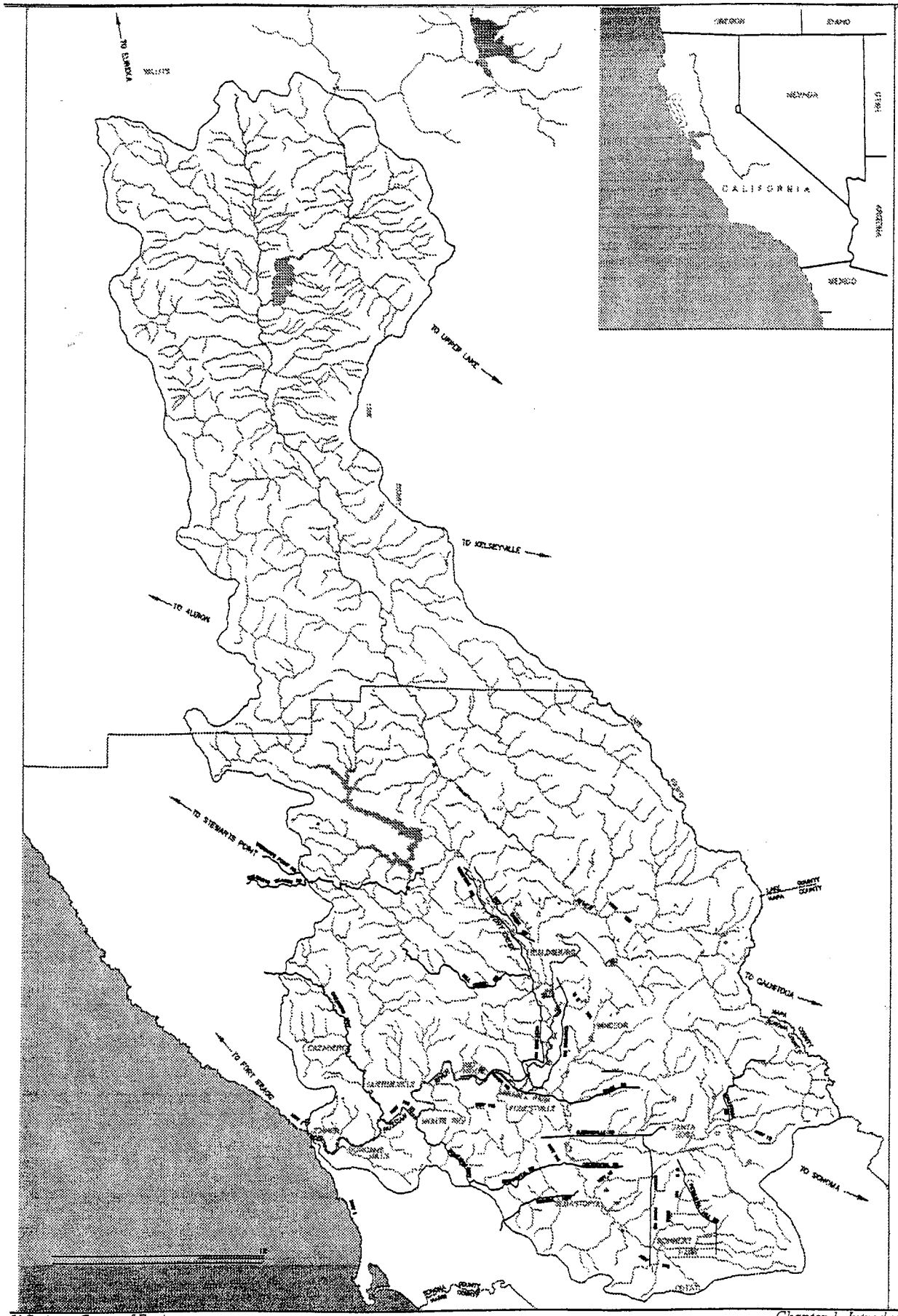
1.2 BACKGROUND

The Russian River originates in central Mendocino County, California, approximately 15 miles north of the city of Ukiah. The watershed encompasses 1, 485 square miles (approx. 950,000 acres) within Sonoma and Mendocino Counties, see Figure 1. It empties into the Pacific Ocean at Jenner, about 20 miles west of the city of Santa Rosa. The main channel of the river is about 110 miles long and flows generally southward from its headwaters near Redwood and Potter Valleys to Mirabel Park, where the direction of flow changes generally westward as the river crosses a part of the Coast Range and eventually flows into the Pacific Ocean near the town of Jenner.

The Russian River, including the diversion of an average of 160,000 acre feet per year of Eel River water (about 10% of the Russian River's average annual runoff), is the primary source of water for 500,000 people and extensive agricultural development within Mendocino, Sonoma, and Marin Counties. The principal communities in the watershed are the Potter Valley, Ukiah, Hopland, Cloverdale, Healdsburg, Windsor, Forestville, Sebastopol, Santa Rosa, Rohnert Park, Cotati, and the Russian River Resort area, which stretches from Mirabel Park to the mouth of the Russian River, and contains the communities of Duncans Mill, Guerneville, Jenner, Monte Rio, Occidential, Redwood Valley and Rio Nido.

Over the past several decades, environmental resource concerns in the watershed have been identified and the need for restoration of these resources has been established as another of the region's major goals. Because many physical and social changes have occurred over time, including hydrologic conditions, recognition of environmental issues, the federal listing of Coho salmon and steelhead trout, land use changes, and river uses, changes do to the diversion of Eel River water, a community-based guiding vision for watershed management is needed.

Historically, the Russian River basin has experienced frequent flood events that have deposited nutrient rich soil in the flood plain. However, Sonoma County is the highest repetitive flood loss area in California resulting in the loss of life and property. Over time, society's needs have changed and lessons have been learned regarding the most effective approach to long-term flood protection and watershed management. One lesson learned is that the most effective management of the flood relief may not be a primarily "structural approach" of building levees and dams, but rather a combination of structural and nonstructural approaches that consider the


TO EUREKA
TO UPPER LAKE
TO KELSEYVILLE
TO ALBION
TO STEWARTS POINT
TO FORT BRAGG
TO CALISTOGA
TO SONOMA
OREGON
IDAHO
NEVADA
CALIFORNIA
ARIZONA
MEXICO

many interrelated benefits to society offered by the river system. Other factors that are affecting the ecological health of the river are the impact of the Corps flood control operations at Warm Springs and Coyote Dams; the dams are blocking spawning and rearing areas and changing the hydrology and physical structure of the mainstem. In addition, water supply demands change the flow regime in the river system; diversion in the tributary streams change the dynamic equilibrium of the stream channel; and upland and instream activities affect water quality and stream channel stability. It is in the public interest to look at opportunities to prevent or reduce flood damages, to restore riverine ecosystem values and the wise use of floodplains, to restore watershed functions through restorative land-use practices, and to conserve remaining hydrologic and ecological resources.

The Federal Government, the State of California, Counties of Sonoma and Mendocino, Native American Tribes, and the cities and residents in the Russian River watershed have recognized the need for a new comprehensive approach to watershed management. The watershed study will provide the opportunity to improve the ecological health of the Russian River watershed. The watershed study's goal is a watershed management plan to address the potential structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures that will be undertaken in the watershed with State and Federal funding through the State of California Resources Agency and the Corps of Engineers. In addition, Watershed Council will seek participation from other federal, state, and local agencies through existing programs or proposals for new State and/or Federal legislation.

1.3 SCOPE AND OBJECTIVES

The watershed study will be structured in two phases. The objective of the Phase I effort is to support the Watershed Council and other stakeholders, including responsible agencies in the watershed, to identify watershed problems and opportunities, establish long and short-term planning objectives and constraints, identify potential protective and restorative projects, compile and analyze relevant existing data and information and identify critical needs. Specific objectives of the watershed study will be developed as the Watershed Council and other stakeholders identify issues of highest concern and priority. The preliminary objectives are to ensure and improve the viability of the threatened Coho salmon and steelhead trout, improve the viability of other fish and wildlife species and their habitat, restore and enhance riparian habitat in the Russian River watershed, modify operation and maintenance of Federal and local projects to reverse adverse impacts to listed species, protect and enhance water quality, educate the public on watershed issues, and build trust between stakeholder groups.

The Watershed Council will have the opportunity to implement specific projects as the Watershed Council clarifies the issues during Phase I. The product of Phase I will be a Phase II Plan of Action developed according to the Watershed Council's recommendations based on the preliminary studies, discussions and findings from Phase I. The Phase II Plan of Action and a revised PSP will be sent to HQUSACE for support of the tasks to be completed in Phase II. The

watershed study and completion of the watershed management plan are just two aspects of the on-going efforts of the Watershed Council.

During the second phase of the study, the Watershed Council and other stakeholders will complete the analyses needed to identify potential implementation studies and complete the watershed management plan.

1.4 PHASE I EXPECTED PRODUCTS AND OUTPUTS

The watershed study will rely on active public involvement through the Watershed Council and other stakeholders to bring to light various issues critical to watershed management and protection of Russian River values which will include: economic, agricultural, recreational, industrial, fisheries and environmental restoration and flood damage reduction issues. The Watershed Council's broad-based composition of residents in the Russian River watershed and other stakeholders will ensure that there is community representation and participation in the development of the watershed management plan.

Potential concurrent activities that will be initiated during Phase I will feed into the final watershed management plan. These activities will be implemented by the Watershed Council and will include:

- Development and Support of the Watershed Council Operations
- Development of a Strategic Plan with Implementation Scope
- Development of a Watershed Restoration Information System
- Development of a Restoration Project
- Phase II Plan of Action and Revised PSP

1.4.1 Russian River Watershed Council

The Watershed Council is comprised of stakeholders representing the diversity of economic and environmental interests throughout the watershed. The Watershed Council has accepted the responsibility for developing collaboratively with the Corps of Engineers and the State Resource Agency a watershed management plan that the local community will use to guide future efforts to protect and restore the Russian River watershed. The Watershed Council will serve as a public forum and provide public outreach activities, such as: public meetings, organizational framework, and facilitation. As part of Phase I efforts, the Watershed Council will review critical issue information, evaluate existing research data and recommend additional studies. Also, as part of this effort, the Watershed Council will develop a strategic plan with

implementation scope, a watershed restoration information system, a specific restoration project, and a Phase II Plan of Action. The Corps and the Resources Agency understand that the Watershed Council may wish to pursue any number of activities outside of the scope of the PSP.

1.4.2 Strategic Plan with Implementation Scope

The strategic plan, with implementation scope, will finalize the Watershed Council's procedural processes and will identify ecosystem restoration and protection measures that may be undertaken in the watershed. The Watershed Council, during the development of this PSP, identified a list of watershed issues critical to the restoration of the watershed, see Appendix C. The list is comprehensive in scope. Many of these issues will be pursued without the Corps direct involvement. Categorizing the issues will occur during the strategic planning process. Development of the strategic plan is a work in progress to be formalized in the Phase II Plan of Action. The Plan of Action will prioritize and formalize the issues as Phase II tasks. The development of the watershed study tasks will include the following:

1) Identification by the Watershed Council and other stakeholders of problems, opportunities, constraints, and planning objectives.

2) Preliminary evaluation and screening of Watershed Council activities to identify the diverse outputs that will be realized:
-ecosystem restoration (habitat type by acre)
-categorizing the federally listed species improvement
-address incidental benefits to watershed education, recreation, water supply, water quality, and other related water resources

1.4.3 Watershed Restoration Information System

The Watershed Council will develop an information system and complete a data gap analysis. The information system will provide a method for reviewing and evaluating the adequacy and accuracy of information critical to watershed planning. The information system will provide a context for evaluating combinations of conditions in the watershed to identify measures that most effectively achieve multiple objectives. This information can then be used to develop a watershed management plan that includes structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures that may be undertaken in the watershed. Development of the watershed restoration information system and data gap analysis will include:

1.) The development of a user friendly information system. The Watershed Council has identified Klamath Resource Information System (KRIS) as a potential information system to develop baseline information (topographic base maps, habitat data, etc.).

2.) The development of a data gap analysis to identify the existing information and to determine were additional data is critical for the development of a watershed strategy.

If, in the process of preparing the strategic plan and the watershed restoration information system, it becomes clear that some elements can and should be implemented, the identification of authorities (i.e. Corps programs, FEMA programs, NRCS programs, the State's Designated Floodway Program, EPA grants, public and private grants) to immediately implement such elements should occur.

1.4.4 Development of a Restoration Project

The Corps of Engineers will develop a restoration project identified by the Watershed Council. The Corps, with input from the Watershed Council, will investigate the potential hydrologic and engineering modifications of the Coyote and Warm Springs Dams' outlet structures to reduce the detrimental effects to the downstream ecosystem.

1.4.5 Phase II Plan of Action and Revised PSP

The Watershed Council and other stakeholders will synthesize the information developed in the strategic plan into a Phase II Plan of Action. The documenting of information in the Plan of Action will clarify the watershed problems and opportunities, establish planning objectives and constraints, document baseline data, identify potential restoration and protection projects and identify the initial screening of measures. The Watershed Council and the local sponsor will review and approve the Plan of Action and a revised PSP before it is reviewed by HQUSACE for authorization of Watershed Council operations and the products being developed in Phase II.

1.5 CONCURRENT ACTIONS

The Federal authority for the development of this study and the State of California Resources Agency's watershed focus allows the flexibility to investigate a wide array of potential solutions. The Russian River watershed problems and potential restorative measures are extremely complex and intertwined. The Watershed Council and other stakeholders, which include agencies with various jurisdictions, different authorities, and numerous resources for implementation, recognize that full implementation of a watershed solution could take many years to achieve. There must be a continuous process of reassessing the objectives and goals of the overall solution. The goals and objectives will be developed and continuously refined as the critical issues, interests, and stakeholders are identified. The adaptive process must be able to evaluate immediate, near-term, and long-term goals.

As the Watershed Council and other stakeholders clarify issues, projects will be identified that are currently in process or already identified for funding and can run concurrently with newly identified projects. Additionally, specific projects within the watershed may be

identified and implemented by the Corps and by others through existing authorities where possible (such as the Civil Works Program of the Corps, the Watershed Protection and Flood Prevention Program of the Natural Resources Conservation Service, the Hazard Mitigation Grant Program of the Federal Emergency Management Agency, the Environmental Protection Agency and Water Quality Control Board Clean Water Act grant programs, as well as the Coastal Conservancy, the National Marine Fisheries Service, the Department of Fish and Game, local and private grant programs and others) and through new authorities where necessary.

1.6 RELATED PROGRAMS

The development of the watershed plan by the Watershed Council and other stakeholders in Phase II will provide an information and coordination base for on-going Russian River watershed programs. Many local agencies and organizations including the California Department Fish and Game, the Resource Conservation Districts, the Natural Resource Conservation Service, the North Coast Regional Water Quality Control Board, Circuit Riders Productions, Inc., and others are implementing these programs. A partial list of currently known programs and descriptions and implementation of these programs are listed in Appendix A. These programs are important to the restoration and protection of the Russian River watershed and will be essential to the Watershed Council and other stakeholders for the development of the watershed management plan. The Watershed Council will work with local agencies and other parties to identify existing programs and project in the watershed. This information will be used in an information system to increase the effectiveness and public education of Russian River watershed restoration.

CHAPTER 2 - MANAGEMENT AND EXECUTION OF STUDY

2.1 GENERAL

The objectives of the Watershed Council are to protect, restore, and enhance the environmental and economic values of the Russian River watershed through an open community-based process, which facilitates collaboration and communication among all interested parties.

The watershed study will be developed with the Watershed Council and other stakeholders. The Watershed Council will be responsible for identifying issues of concern in the watershed and finding solutions through collaborative process. It is proposed that the Watershed Council form focus groups to clarify and define alternatives for discrete issues. It is the responsibility of the Watershed Council to partner with the Corps of Engineers, the State of California and other appropriate funding sources in the development and technical execution of the study. It is the intent of the State to enter into a Memorandum of Understanding with the Watershed Council to ensure that this study implements only those activities supported by the Watershed Council. As the opportunities are made available, the Watershed Council will implement restoration programs and projects with other agencies to further the restoration in the watershed.

The process for management and execution of the study may be adjusted based on the refinement of goals and priorities of the Watershed Council but will maintain conformance to any standard management requirements of the funding sources.

2.2 EXECUTIVE COMMITTEE

The Russian River Watershed Study will focus on multi-objective and comprehensive solutions. The Watershed Council, the Corps of Engineers, the State of California Resources Agency, and other Federal, State, and local agencies, will develop the study. An Executive committee will be established to sign and implement the Feasibility Cost Share Agreement (FCSA) . The Executive Committee co-chaired by the Corps of Engineers and the State Resources Agency will maintain a working knowledge of the progress of the study, provide oversight to changes in study scope, costs, and schedule; provide direction on resolution of policy issues; and provide guidance to ensure study results and policies are consistent and coordinated with the overall desired outputs and programs. A representative of the Sonoma County Board of Supervisors, a representative of the Mendocino County Board of Supervisors, and three representatives of Watershed Council will sit as members of the Executive Committee and sign the FCSA to show their support for the process. The Watershed Council may choose to change those representatives as necessary. The supervisors and the council members will be advisory members to the Executive Committee, see Table 1.

The Executive Committee will participate in Issue Resolution Conferences (IRC's) . At least one IRC will be held prior to completion of the Phase II Plan of Action and the revised PSP to ensure that all issues are resolved before the revised PSP is submitted to higher authority. Additional IRC's will be held, as required, throughout the study to resolve any problems that may arise.

Table 1. Executive Committee Co-Chairs and Participating Parties

Co-Chairs			
Organization	**Name/Title**	**Address**	**Phone**
CO-CHAIRS			
Corps of Engineers CESPN-DE	Peter Grass, LTC District Engineer	333 Market Street San Francisco, CA 94105	(415) 977-8500
State of California Resources Agency	Douglas Wheeler, Director	1416 Ninth St., Rm 1601 Sacramento, CA 95814	(916) 653-5434
ADVISORY MEMBERS			
Sonoma County	Mike Reilly, Sonoma County Board of Supervisors	575 Administration Drive Santa Rosa, CA 95403	(707) 527-2241
Mendocino County	Richard Shoemaker, Mendocino County Board of Supervisors	501Low Gap Road, Rm. 1090, Ukiah, CA 95482	(707) 463-4221
Russian River Watershed Councilmember	(to be determined)		
Russian River Watershed Councilmember	(to be determined)		
Russian River Watershed Councilmember	(to be determined)		

2.3 STUDY MANAGEMENT

Study Management will consist of the Watershed Council working with the Corps of Engineers, the State of California Resource Agency (the Sponsor) and various technical staff to develop the watershed management plan and a restoration project. The Corps' Study Planner and the State's coordinator, with the input of the Corps' Project Manager, will work with the Watershed Council on the day-to-day activities of the watershed study. The Project Manager will report and provide information briefs to HQUSACE. The Study Planner, working with the Watershed Council will provide for a continuous flow of information and coordination between the Watershed Council, the Division Office, and other interested parties. The Project Manager will also coordinate with HQUSACE the review of interim products and, with the assistance of the Study Planner, will coordinate directly with HQUSACE Policy, Planning, and Programs Divisions representatives.

The Project Manager, with the assistance of the Study Planner and the Watershed Council, will ensure and facilitate the transfer of funds between organizations for the purposes of funding interagency and Watershed Council participation in the study.

2.4 STUDY EXECUTION

The Watershed Council and other stakeholders will be responsible for identifying study direction and eventual solutions. This on going process will have the technical and logistical support of agencies participating in the process. The Study Planner will work with the Watershed Council in the day-to-day execution of the study tasks. Members of the Watershed Council and the Corps' Project Manager with input from the Study Planner will participate in the transfer of funds between organizations to determine funding priorities and plan formulation tasks. The Watershed Council and other stakeholders will ensure appropriate scope of the studies; assist in gathering required data, formulating restorative measures and criteria, make sure that the study schedule and budget are maintained, that sound technical judgment is followed, and that multi-disciplinary studies and decisions are made in accordance with applicable guidelines and policies.

2.5 SCHEDULE AND COST CHANGES

The Council, the Sponsor, and the San Francisco District can request changes to the PSP's scope, cost, and/or milestones by submitting a Schedule and Cost Change Request (SACCR) for PSP revisions. The Watershed Council and the Sponsor representatives will review and agree to changes proposed by the SACCR before subsequent action by the appropriate level of approval.

2.6 TECHNICAL REQUIREMENTS AND QUALITY CONTROL

The work to be performed will develop management plans for implementing solutions for problems in the watershed. The plans that best address the planning objectives of the Watershed Council and other stakeholders will be carried into a final array of alternatives, and from these alternatives, a recommended watershed management plan will be selected. Work on the watershed management plan will include plan formulation; technical analysis; preliminary design calculations, if appropriate; preliminary cost estimates; real estate investigations, if appropriate; study management; and coordination with local, state, and Federal agencies as well as environmental and other interest groups and the public. The scope of studies in terms of content and level of detail are as defined and required by the documents in Appendix B.

To assure the production of high quality and technically complete products and reports, the Watershed Council, the Corps and the State will be responsible for various quality control activities during the study. A quality control process will be used to ensure that the technical products are in compliance with applicable laws and regulations, and with sound technical

practices. The Watershed Council's quality control process will be established as the study develops. The Corps is required to accomplish a series of technical reviews. The technical review will be conducted in accordance with procedures that have been established in the San Francisco District's Quality Management Plan, CESPN OM 1110-1-120.

Milestone conferences are conducted to ensure that the study is completed on schedule and within budget. The Corps will establish a technical review team to review the Phase II Plan of Action and the draft and final watershed management plan. The members of the Corps' technical review team are listed below. Materials will be submitted to the Corps' review team at least two weeks before each milestone date and the Corps' technical review will be completed at least one week before the milestone dates. The members of the Watershed Council's technical review team will be identified during Phase I. The Watershed Council's review team will work with the Corps to ensure that all required milestones are met.

An in-progress-review (IPR) conference will be convened with representatives from the Watershed Council, the Sponsor and the Corps' Headquarters. The purpose of the IPR conference will be to review the study progress to date and to evaluate the study scope. Based on the in-progress-review and the support of the Watershed Council, this PSP may be revised to better define the depth of analysis required, refine study constraints, and/or to refocus study efforts.

Technical Review

Watershed Council Team		
To be determined		
Corps of Engineers Team		
Rod Chisholm	CESPN-PE-P	Planning Branch
Scott Miner	CESPN-PE-PF	Plan Formulation
Peter LaCivita	CESPN-PE-PS	Environmental Planning
Richard Stradford	CESPN-PE-PP	Environmental Studies
Ken Kuhn	CESPN-PE-E	Engineering
Carlos Hernandez	CESPN-PE-EH	Hydraulic/Coastal Engineering
George Dennis	CESPN-PE-ED	Civil Design
Kevin Knight	CESPN-PE-C	Economics
Susan Miller	CESPK-RE	Real Estate

CHAPTER 3 - STUDY TASKS AND COST ESTIMATE

The following chapter describes the tasks and subtasks to be performed with the concurrence of the Watershed Council and other stakeholders as part of the watershed study to identify potential structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures that will be undertaken in the watershed. The actions will include:

coordinating and supporting the Watershed Council;

completing technical studies (e.g.: dam outlet structure, habitat assessments, sediments budgets, etc.), as necessary;

developing a framework for watershed assessment and planning; and

producing implementation plans for elements of the watershed plan.

Although the four major actions identified in this summary are presented as independent discussions, all four actions will be integrated to support a community-based decision-making process, assess current conditions in the watershed, develop potential ideas and solutions, formulate and evaluate alternatives to develop a recommended plan. Phase II will be developed further as Phase I issues are clarified through the Watershed process.

The planning process schedule is 5 years, with a major milestone occurring at 2 years. This 2 year milestone separates the study into two phases. Phase I of the study consist of developing the Council's strategic plan with implementation scope, the restoration information system, the development of a restoration project (i.e.: modifications to the Corps' dam outlet structure), and the Phase II Plan of Action for identifying structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures in the watershed. During Phase II, a detailed task analysis will be complete for each of the tasks identified during Phase I by the Watershed Council. These task analyses will integrate engineering, economic, environmental and other technical evaluation to support the development of restoration measures and alternatives. The restoration measures and alternatives will lead into the development of alternative plans that will constitute the framework for the watershed management plan.

3.1 STUDY TASKS

This section provides the scope of work and the major products developed in Phase I. The study tasks will determine the scope and direction of the second phase. The following are the potential products that will be developed by the Watershed Council in Phase I of the watershed study and documented in the Phase II Plan of Action:

■ PARTICIPATING IN WATERSHED COUNCIL – The complexity of the issues and problems inherent in a watershed study requires that there be widespread community involvement in the planning process. Information exchange between stakeholders and responsible agencies will be managed by ensuring ongoing public input. The Watershed Council will convene (possibly bi-weekly) to address the issues relevant to the environmental and economic health of the watershed.

■ DEVELOPING A STRATEGIC PLAN WITH IMPLEMENTATION SCOPE – The strategic plan will finalize the mission, vision, and values of the Watershed Council. The strategic plan will include implementation scope for individual tasks identified by the Council to be developed further in Phase II.

■ DEVELOPING WATERSHED RESTORATION INFORMATION SYSTEM - The restoration information system will include the development of a user friendly information system and complete a data gap analysis. The restoration information system is intended to provide a context for evaluating combinations of conditions to identify measures that most effectively achieve multiple objectives. The Watershed Council and other stakeholders will develop the watershed restoration information system with the necessary technical support.

■ DEVELOPING RESTORATION PROJECT - The Corps of Engineers will investigate the development of a restoration project to improve the ecological health of the watershed. The Corps, with input from the Watershed Council, will evaluate the potential modification of the Coyote and Warm Springs Dam's outlet structures to reduce the detrimental effects to the downstream ecosystem.

The watershed planning process will be dynamic. Several of the tasks will be conducted concurrently, and as the process progresses, various tasks or phases of the process will be revisited, revised, and possibly rescoped. Moreover, specific subtasks may change or be refined as a part of adaptive study management.

PHASE I TASKS - The tasks conducted during Phase I of the study.

3.1.1 Russian River Watershed Council Operations

Potential activities of the Watershed Council will include serving as the forum for identifying problems and potential solutions for ecosystem issues in the watershed (see Appendix C); implementing a quality control process for study development; identifying and contacting stakeholders in the watershed; determining potential event locations; designing and holding public involvement activities; and developing public notices.

3.1.1.1 Watershed Council Activities

Public involvement is critical in the planning process and public involvement is required in Phase II by the NEPA/CEQA process. The Watershed Council will include stakeholders from throughout the watershed to identify issues, work together to resolve differences, work with responsible agencies to identify study direction, and identify possible solutions from the information provided by the technical advisors. The following sections describe the potential different types of activities and review groups.

Public Meetings. Public meetings will be held in designated locations throughout the watershed. These meetings will be designed to elicit stakeholder and general public input on the issues, problems, and opportunities that should be considered as regional options and watershed study plan alternatives are developed for structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures that will be undertaken in the watershed.

Watershed Council Workshops. Watershed Council workshops will be more focused in scope, smaller in scale, and more frequently held than scoping and public meetings. The format will be round-table discussions to develop a working relationship to reach solutions and conclusions on specific issues.

Focus Groups. As part of the process, focus groups will be formed to focus on key technical issues. These focus groups, made up of stakeholder representatives and interested members of the public, as well as, technical professionals and scientists from the academic and research community, will be involved with many of the Watershed Council meetings.

The Phase I Corps and State total cost for sub task 3.1.1.1 is $480,000

3.1.2 Strategic Plan with Implementation Scope

The strategic plan will finalize the Watershed Council's mission statement and vision statement. The goals and values of the Watershed Council will be identified to ensure that the overall watershed restoration objectives are addressed. To ensure that this process meets the needs of all the stakeholders in the watershed, the strategic plan will include a list of tasks to be accomplished in Phase II of the watershed study, including a preliminary evaluation of scope of work, cost and schedule for each task.

The strategic plan will also identify public involvement activities. These activities will include information tools such as designing a newsletter, a web page and other methods of communicating with the public. Additional methods will be developed that will faciliate interaction between the Watershed Council and other stakeholders throughout all phases of the study. The program will include a discussion of how the Watershed Council's recommendations will be developed into a watershed management plan.

3.1.2.1 Specify Tasks Associated with Watershed Restoration

The Watershed Council, with the support of the Study Planner, will develop potential watershed restoration tasks in order to identify problems with and opportunities for implementing structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures in the Russian River Watershed. The task selection process will involve applying an orderly and systematic approach to addressing all key steps in the planning process, from identifying problems and opportunities to developing overall goals, objectives, alternatives, and a recommended plan for the watershed.

During meetings held in August and September of 1998, the Watershed Council identified critical ecological issues in the watershed, see Appendix C. All the issues are important to the restoration of the Watershed. Several of the listed issues are outside of the Corps authorities, therefore they will be pursued without the Corps direct involvement. The Watershed Council will review, refine and prioritize the issues that they collaboratively agree merit further study. These issues will be specified as tasks in the Phase II Plan of Action and the revised PSP.

The Phase I Corps and State total cost for sub task 3.1.2.1 is $180,000

3.1.2.2 Develop Public Involvement Tools

The Russian River Watershed Study will be geographically and demographically extensive in scope. It will require several years of planning to accomplish the expressed goals of the study. Decisions made during this process regarding structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures will potentially affect a wide range of stakeholders. Therefore, it is important to have in place from the outset of the study, a programmatic approach to public involvement. The following section presents the numerous tools that will be used to effectively involve stakeholders.

Public Outreach Program Outline. An outline will be developed at the outset of the study to identify elements the Watershed Council's public outreach strategy. This hardcopy and/or digital outline will be designed to be a ready-reference guide to public involvement over the life of the study. The outline will be designed to be user-friendly and may include sections on the following topics:

- watershed background,
- key issues,
- public involvement methods and rationale,
- public involvement products and activities, and
- activities schedule,

Potential issues to be discussed will include: frequency of public outreach efforts and publications; definitions and applicability of public involvement event types;

communication procedures; roles and responsibilities of agencies and other stakeholders; media involvement; responses to comments, event transcripts, and other documents; and facilitation and mediation methods.

Using this product as a guideline, the following additional public involvement tools will be developed and implemented.

Mailing List/Database. A master mailing list will be developed beginning with the key stakeholders and then adding to it members of the public who express an interest in being on such a list. Opportunities to be included on the list will be offered through sign-up sheets at all study-related gatherings as well as through the development of a study-specific web page and newsletter.

Web Page. A watershed-specific web page will be developed that can include a wide range of information, including but not limited to updates of the administrative record, newsletters, stakeholder contact information, watershed maps, real-time updates on the watershed activities and many other topics. The web page can be set up at an existing address, such as the Corps or DWR, or developed as a stand-alone address.

Newsletter. A newsletter will be authored and distributed on a predetermined schedule to everyone on the master mailing list. The newsletter will carry similar but smaller amounts of information than the study web page.

Media Packets. Watershed-specific packets will be prepared as needed for local and regional media. These packets may include technical fact sheets, maps, updates on public involvement activities, and other topics. Periodic news conferences may also be conducted to allow question and answer periods on key topics and with key staff. Public notices and public service announcements will be released as needed.

Multimedia Presentations. Informational presentations using materials such as video, slides, computers, and hardcopy will be produced for use at watershed-specific public gatherings. These presentations can be used to present technical, economic, and demographic data and can also present geographic data. As part of this process, three-panel boards will be used regularly as display units that can be viewed at a participant's leisure. Information presented on these panels can be changed efficiently and economically to match the subject matter of a meeting.

The Phase I Corps and State total cost for sub task 3.1.1.2 is $180,000

3.1.3 Develop Russian River Watershed Restoration Information System

The Watershed Council with technical and logistical support will develop an information system and a data gap analysis. Implementation plans for specific projects, as identified by the Watershed Council during development of this planning effort, may tier off of this watershed study and move forward on an independent track. The Watershed Council and the public outreach strategy will ensure that interested parties are fully aware of and provide input into the development of the information system and the data gap analysis.

3.1.3.1 Information System

The Watershed Council will develop a user-friendly information system that is tailored to the Russian River watershed. The Watershed Council has identified an information system developed in the Klamath River basin, hence Klamath Resource Information System (KRIS) as the preferred information system. The KRIS data base program is a geographic information system and will support the potential structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection measures to be developed by the Watershed Council. Users will be able to obtain current and accurate information about the Russian River watershed from the Information System. This information tool has the potential to give users data on the land topography, vegetative over, ground water and surface water capacity, water quality conditions, fisheries data, restoration project information, photopoints, etc. KRIS has the potential to integrate almost any form of watershed information including: data, charts, photographs, maps, bibliographic resources, etc..

KRIS can be distributed on compact disc and is compatible with the World Wide Web. It can be hot-linked for easy access to reference material or other information databases. Information can be pulled off to add to reports, and KRIS can easily be updated to hold down the cost of information system maintenance.

The Phase I Corps and State total cost for sub task 3.1.3.1 is $180,000

3.1.3.2 Data Gap Analysis

A data gap analysis will identify what data is available and what data is needed to develop structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection watershed strategy. This will include review of existing information, research, and databases to identify important data needs as they relate to assessment and planning objectives of the Watershed Council. The results may be used to recommend priorities for data development or monitoring activities, to develop protocols for monitoring, etc.

The Phase I Corps and State total cost for sub task 3.1.3.2 is $50,000

3.1.4 Develop Restoration Project

The Watershed Council has identified a initial restoration project that is important to the ecological health of the watershed. The Corps of Engineers and the Watershed Council will develop this project as the watershed study progresses. Implementation plans for the project will tier off of the watershed study after justification is determined and may move forward on an independent funding track or be developed in the feasibility phase of the watershed management process.

3.1.4.1 Investigate Modifications to Dam Outlet Structures and Modifications to Dam Operations/Management

Coyote and Warm Springs Dams are multi-purpose reservoirs providing flood protection, water supply and recreational uses for the area. The releases from the dams are believed to have detrimental effects on the downstream ecosystem. The National Marine Fisheries Service specified that the Corps incrementally open and close the dam's outlet gates to prevent the "stranding" of Coho salmon and steelhead trout. During a maintenance shut down, the Corps attempted to comply with the specification but determined that the increased pressure could cause cavitation, impacting the surfaces of the concrete tunnels and damage the existing gate mechanism.

Hydraulic and engineering analyses of the outlet structure's current range of release is critical to determine how the outlet structure can be redesigned to allow for more flexibility and control of releases. The analysis will identify the structural weakness under low flow regimes. Another key component of this evaluation is a design analysis of alternatives that allow the Corps to reduce maintenance. The Corps' water management plan is the guide that the operators follow for dam releases. This document will be updated to reflect improved low flow capabilities.

The investigation of the outlet structures has the support and concurrence of the Watershed Council. The design and cost of modifications to the structure will be determined in Phase II.

The Phase I Corps and State total cost for sub task 3.1.4.1 is $170,000

3.1.5 Prepare Phase II Plan of Action and Revised PSP

The Phase II Plan of Action will provide specific information documenting the Watershed Council's mission and values, the watershed information system and data gap analysis, the basis for proceeding with the scientific and engineering detailed analysis of tasks identified in Phase I, and the justification for developing a restoration project to modify the dam's outlet structures. This involves summarizing planning work performed to date, including a refined description of planning goals and objectives, problems and opportunities, existing and available data, resources conditions and trends and a preliminary evaluation of the measures necessary for watershed restoration. The Plan of Action will not contain descriptions of

watershed alternatives; however, it will describe and evaluate individual measures intended to address specific watershed needs. Measures will serve as the building blocks for later development of composite, integrated measures that make up alternative plans.

After completion of the Phase II Plan of Action, this PSP will be revised and updated to reflect the tasks required to complete Phase II of the watershed study. The revised PSP will be reviewed and approved by the Watershed Council and the Sponsor and then be submitted to HQUSACE for approval.

The Phase I Corps and State total cost for sub task 3.1.6 is $210,000

3.2 IMPLEMENTATION OF PHASE II PLAN OF ACTION

The tasks and preliminary measures that will be identified and evaluated by the Watershed Council in Phase I and presented in the Phase II Plan of Action will have detailed tasks analysis completed in Phase II for incorporation into the restoration measures identified by the Watershed Council. The Watershed Council and other stakeholders will complete further analysis to identify multi-objective restoration measures to incorporate into the alternative plans for addressing watershed restoration and protection goals. This iterative process will be conducted by the Watershed Council in Phase II of the watershed study and documented in the watershed management plan:

- PARTICIPATING IN WATERSHED COUNCIL – The complexity of the tasks developed in Phase I require that there be continued widespread community involvement in the planning process. Information exchange between the Watershed Council, other stakeholders and responsible agencies will ensure ongoing public input to address the tasks relevant to the environmental and economic health of the watershed.

- DEVELOPING DETAILED TASK ANALYSIS – The detailed task analysis will include scientific and engineering parameters for individual tasks identified by the Watershed Council, during Phase I. The Watershed Council will incorporate the tasks into the restoration measures as the process develops.

- DEVELOPING WATERSHED RESTORATION MEASURES - The restoration measures will refine and evaluate the task analysis to identify a combination of conditions that most effectively achieve the multi-objective goals of the Watershed Council. The Watershed Council and other stakeholders will develop the watershed restoration measures with the necessary technical support.

- DEVELOPING ALTERNATIVE PLANS - The Watershed Council and other stakeholders will assess and prioritize the multi-objective restoration measures for inclusion into the alternative plans. Alternative plan development will meet the goals and

objectives of the Watershed Council to restoration and protection of the Russian River watershed.

■ DEVELOPING WATERSHED MANAGEMENT PLAN – The watershed management plan will finalize the information developed through the detailed task analysis, the multi-objective restoration measures and the alternative plans to prioritize the goals and objectives of the Watershed Council and other stakeholders in the watershed. The watershed management plan will emphasis a sustaining process to address existing problems and concerns and provide a vehicle to deal with new ones if they arise.

The watershed planning process will be dynamic. Several of the tasks will be conducted concurrently, and as the process progresses, various tasks or phases of the process will be revisited, revised, and possibly rescoped. Moreover, specific subtasks may change or be refined as a part of adaptive study management. During the development of this watershed planning process, potential project may tier off and proceed on an independent track by the appropriate Federal, State, and local agencies, non-profits and other as funding sources are identified. The Corps' guidance documents identify a list of tasks that would typically be included into a PSP. A few of these tasks are listed below. During Phase I, the Watershed Council will review and determine which of these tasks are relevant to the completion of the watershed management plan. The costs identified in Phase II are subject to change based on input from the Watershed Council.

PHASE II TASKS - The remaining tasks will be conducted during Phase II of the study.

3.2.1 Watershed Council Operation and Public Involvement

The Watershed Council will work collaboratively with the Corps, the State, and other stakeholders to develop the products of Phase II, including the watershed management plan. The public involvement tools that are identified in Phase I will continue to be used in Phase II, see Section 3.1.1 and 3.1.2.2. Public involvement is critical in the planning process and public involvement is required by the NEPA/CEQA process. The Watershed Council will hold meetings, coordinate public outreach, and disseminate information regarding possible actions in the watershed. This will include an assessment of public awareness and perceived values of watershed-based ecosystems.

The Phase II Corps and State total cost for task 3.2.1 is $450,000

3.2.2 Coordination of Potential Projects

Because of the geographic and demographic scope of the Russian River Watershed Study, it is fully anticipated that several potentially feasible projects will be identified by the Watershed Council on a subarea basis during the planning phase. These prioritized potential

projects will fulfill the goals of the Watershed Council, match the specific objectives of the watershed study, meet the programmatic definition of water resource problems, and have existing or easily acquired support for implementation by federal, state, and local agencies and other groups. Therefore, as part of the watershed study, the study will develop procedures to identify potential projects. These potential projects will have the preliminary scientific and engineering analysis completed to support their further development. Because of the time required to develop this information, it is anticipated that the majority of these projects will be identified during the latter part of the study. Therefore, the funding will shift from task development to preliminary project development as the watershed study reaches completion. Once the Watershed Council identifies the projects, they will be expedited as appropriate under Federal, State, and local authorities. The intent of this approach is to build flexibility into the watershed planning process that allows for timely implementation of workable solutions, rather than waiting for the completion of the Russian River Watershed Management Plan, which may take several years. A caveat to this approach will be the requirement that regardless of the acceptability of a particular potential project on a subarea basis, the projects should not conflict with the overall goals and objectives of the entire watershed management plan.

The Phase II Corps and State total cost for task 3.2.2 is $400,000

3.2.3 Detailed Analysis of Watershed Restoration Tasks

Watershed issues identified by the Watershed Council (see Appendix C) will be developed into tasks in Phase I. The tasks identified by the Watershed Council in Phase I will have a detailed analysis completed during Phase II. The analysis will identify and delineate clear and specific goals and objectives for the related problems and opportunities in the watershed. The process to identify, define, and refine the tasks is not a linear process but will continue to be clarified throughout the watershed management plan development. In addition, goals and objectives will be identified as immediate, near-team, and/or long-term to recognize that the implementation of the watershed management plan is a continuous process. During the detailed task development process, there may be potential projects identified. The justification of these projects and future projects will be supported by the scientific and engineering data analysis developed by the Watershed Council during the detailed task development proces in Phase II.

The Phase II Corps and State total cost for task 3.2.3 is $400,000

The following tasks are identified in Corps guidance. The Watershed Council will determine whether or not these tasks warrant further development during the planning process for incorporation into the watershed management plan.

3.2.3.1 Institutional Studies

This task involves determining the financial and legal arrangements required to implement recommendations made during the watershed management plan development.

The Phase II Corps and State total cost for task 3.2.3.1 is $150,000

3.2.3.2 Environmental Studies

The environmental studies task will cover ecological effects of alternatives on biological and abiotic resources in the watershed. The Watershed Council identified many environmental issues, see Appendix C, which will be prioritized and defined in Phase I. Investigation of the identified tasks will be multi-objective in approach to meet structural and nonstructural environmentally and economically sustainable ecosystem restoration and protection needs in the watershed. This task will identify the environmental benefits of different components of the watershed management plan. The environmental benefits will be clearly stated by type, function, and near and long term values and objectives.

The Phase II Corps and State total cost for task 3.2.3.2 is $300,000

3.2.3.3 Fish and Wildlife Studies

The Watershed Council will develop the fish and wildlife studies in accordance with the Fish and Wildlife Coordination Act. The work may be performed by the Corps of Engineers, the US Fish and Wildlife Service (USFWS) and the California Department of Fish and Game with the concurrence and support of the Watershed Council. Included into this task is the examination and identification of wildlife species.

The Phase II Corps and State total cost for task 3.2.3.3 is $250,000

3.2.3.4 Economic Studies

The economic studies task will require the development of baseline information to analyze the benefits and costs of selected restoration alternatives. Economic evaluation will not duplicate existing research but provide a vehicle for using the existing information to identify and prioritize restoration opportunities. The study will evaluate the efficiency and cost effectiveness of alternatives for ecosystem restoration. This information will support the decision-making process for potential projects. Outputs will attempt to be multi-objective in scope. The benefits and costs analysis will evaluate the watershed management outputs (habitat units) and their cost. Habitat values will be in terms of habitat units (from HEP analysis) or other appropriate methodology identified by the Watershed Council.

The Phase II Corps and State total cost for task 3.2.3.4 is $100,000

3.2.3.5 HTRW Studies

There will be a preliminary HTRW field investigation and literature search. The results of this investigation will dictate the need for further investigation.

The Phase II Corps and State total cost for task 3.2.3.5 is $60,000

3.2.4 Expand Information System and Other Data Collection Tools

It is anticipated that the information system and the data gap analysis will need to be further refined to analyze potential structural and nonstructural environmentally and economically beneficial ecosystem restoration alternatives. In addition, it is anticipated that the detailed analysis of the tasks will require analytical models, field surveys and other approaches to task development. During the development of this PSP, the Watershed Council identified data collection tools, see Appendix C. These tools will support the information system and model development, as well as the inventory and forecast of resource conditions and will continue through the evaluation of alternatives and the development of a recommended plan.

The Phase II Corps and State total cost for task 3.2.4 is $400,000

The following tasks are identified in Corps guidance. The Watershed Council will determine whether or not these tasks warrant further development during the planning process for incorporation into the watershed management plan.

3.2.4.1 Surveying and Mapping

This task will expand the existing information in several areas, e.g.: aerial mapping, waterways surveying and mapping, and other key information aids to facilitate plan development.

The Phase II Corps and State total cost for task 3.2.4.1 is $440,000

3.2.4.2 Hydrology and Hydraulic Investigation

This task will include development of rainfall-runoff models, debris yields, flood plain mapping, erosion/sedimentation analysis, and aggradation/degradation mapping.

The Phase II Corps and State total cost for task 3.2.4.2 is $300,000

3.2.4.3 Geotechnical Investigation

This task will involve testing of soils to provide data on existing conditions, to evaluate HTRW work in the watershed to be used in the EIS process and for potential projects.

The Phase II Corps and State total cost for task 3.2.4.3 is $200,000

3.2.5 Design and Cost of Restoration Project

The Watershed Council identified modification to the Coyote and Warm Springs Dam's outlet structures as important to the ecological health of the mainstem river system. The preliminary design and cost analysis will be completed in Phase II, including a benefit and cost analysis to justify project development and construction.

The Phase II Corps and State total cost for task 3.2.5 is $400,000

3.2.6 Formulation and Assessment of Restoration Measures

During this phase of the process, the tasks listed in the Plan of Action and detailed in Phase II will be refined to formulate multi-objective restoration measures. These restoration measures will be reviewed and prioritized. Emphasis will be placed on formulating measures that are multi-objective and provide structural and nonstructural environmental and economic benefits. The Watershed Council will screen potential measures with input from responsible agencies. The Watershed Council and other stakeholders will evaluate combinations of restoration measures to determine if they are multi-objective in scope and meet the goals and objectives for watershed restoration and protection.

The Phase II Corps and State total cost for task 3.2.6 is $240,000

3.2.7 Formulate Alternative Restoration Plans

During this phase of the process, the tasks listed in the Phase II Plan of Action and analyzed further in multi-objective restoration measures development will be refined to formulate study alternative plans. The plans are defined by combining several restoration measures to address a range of environmentally and economically beneficial alternatives. The expanded information system and other data collection tools will be used extensively in the process to test alternatives for consistency with the watershed goals and objectives. This is an iterative part of the planning process. Preliminary and conceptual alternative plans will be developed, refined, reviewed, and rejected during the evaluation of the most cost-effective and productive combination of restoration measures.

Evaluation of alternative plans occurs at two levels: the assessment level and the appraisal level. The assessment-level evaluation is the process of measuring or estimating the effects of an alternative plan. It compares the difference between the without-plan condition and with-plan condition for each category or component. The appraisal-level evaluation is the process of assigning social values to the technical information gathered and evaluated at the assessment-level. A cost-benefit analysis will be conducted, and values will be expressed in cost and benefit units.

The Phase II Corps and State total cost for task 3.2.7 is $150,000

The following tasks are identified in Corps guidance. The Watershed Council will determine whether or not these tasks warrant further development during the planning process for incorporation into the watershed management plan.

3.2.7.1 Cultural Resources

This task will determine the impacts of the alternative plan on historical, architectural, and archaeological resources within the watershed and assess the potential impact of each project alternative on these resources. The potential range of preservation or mitigation efforts and the associated cost will be defined.

The Phase II Corps and State total cost for task 3.2.4 is $70,000

3.2.7.2 Engineering and Design Analysis

The engineering and design analysis will be at a sufficient level of detail to evaluate potential restoration project performance. Engineering and design features and cost estimates for various alternatives will be included into the watershed management plan. Engineering and design development will include: engineering analysis, review drawings, site visits, preparation of construction cost estimates, preparation of submittal packages, meeting support, response to comments, and supplemental documentation.

The Phase II Corps and State total cost for task 3.2.7.2 is $160,000

3.2.7.3 Real Estate Studies

The real estate studies will include the evaluations of the sites as it pertains to flood plain mapping, inundation damage analysis, land development analysis, and a gross appraisal of real estate acquisition costs associated with the development of watershed alternatives.

The Phase II Corps and State total cost for task 3.2.7.3 is $50,000

3.2.7.4 Plan Formulation

Plan formulation activities will include reassessing the resources and related problem resolutions for technical feasibility, economic feasibility, environmental impact, real estate acquisition, and views of the public as the alternative plans are developed. In addition, plan formulation activities will include the documentation of the benefits and costs evaluation for different alternatives.

The Phase II Corps and State total cost for task 3.2.7.4 is $280,000

3.2.8 Prepare Watershed Management Plan

Based on the evaluation and comparison of each of the alternatives developed by the Watershed Council and other public stakeholders, a watershed management plan will be prepared. The watershed management plan will prioritize projects and alternatives and be structured to allow for changes in priorities as concerns and problems arise over time. This will ensure that the watershed management plan is a dynamic, flexible plan providing opportunities for active use. The watershed management plan will present an overall integrated vision for the management of an environmentally and economically sustainable ecosystem restoration program.

The Phase II Corps and State total cost for task 3.2.8 is $200,000

3.2.9 Initiate and Complete Environmental Certification Process

The watershed management plan will identify problems and solutions for the environmental and economical health and sustainability of the watershed. These problems and any subsequent problem resolutions identified during the watershed management planning process will be developed in accordance with the requirements of NEPA and CEQA. An EIS and EIR process may be required to assess the effects of any problem resolutions.

The Phase II Corps and State total cost for task 3.2.9 is $200,000

CHAPTER 4 WORK TASKS, RESPONSIBILITIES, AND WORK BREAKDOWN STRUCTURE

Watershed Council operations and the development of the watershed restoration and protection tasks, the restoration information system, the potential restoration project, and the completion of a watershed management plan will be cost-shared between the Corps of Engineers and the non-Federal sponsor on a 50-50 basis. The sponsor will provide a maximum of half of its total share as in-kind services toward the study. Tables 2,3,4 and 5 present the study program by fiscal year, including responsibility, description, and cost for accomplishing tasks.

Table 2. Phase I Task-Specific Cost Estimate Summary ($X1000)

Task No.	Task Description	State FY99	Corps FY99	State FY00	Corps FY00	Total
3.1.1	**Russian River Watershed Council Operations**					
3.1.1.1	Russian River Watershed Council Activities	60	20	250	150	480
3.1.2	**Strategic Plan with Implementation Scope**					
3.1.2.1	Specify Tasks Associated with Watershed Restoration	20	20	60	80	180
3.1.2.2	Develop Public Involvement Tools	40	20	60	60	180
3.1.3	**Develop Russian River Watershed Restoration Information System**					
3.1.3.1	Information System	20	20	80	60	180
3.1.3.2	Data Gap Analysis	10	5	25	10	50
3.1.4	**Develop Restoration Project(s)**					
3.1.4.1	Investigate Modifications to Dam Outlet Structures and Modifications to Dam Operations/Management	5	60	5	100	170
3.1.5	**Prepare Phase II Plan of Action and Revised PSP**	10	20	80	100	210
	SUBTOTAL	165	165	560	560	
	PHASE I TOTAL	**330**		**1120**		**1450**

[1]All costs in thousands of dollars

Table 3. Phase II Tasks – Specific Cost Estimate Summary ($X1000)

Task No.	Task Description	State FY01	Corps FY01	State FY02	Corps FY02	State FY03	Corps FY03	Total
3.2	**Plan of Action Implementation**							
3.2.1	**Watershed Council Operations and Public Involvement**	180	20	150	20	60	20	450
3.2.2	**Coordination of Potential Projects**	40	50	50	60	70	130	400
3.2.3	**Detailed Analysis of Restoration Issues**	60	60	100	100	50	30	400
3.2.3.1	Institutional Studies	20	20	20	30	30	30	150
3.2.3.2	Environmental Studies	50	50	50	50	60	40	300
3.2.3.3	Fish and Wildlife Studies	50	50	50	50	30	20	250
3.2.3.4	Economic Studies	10	10	10	10	30	30	100
3.2.3.5	HTRW Studies				30		30	60
3.2.4	**Expand Information System**	100	50	100	50	90	10	400
3.2.4.1	Surveying and Mapping	140	80	90	50	60	20	440
3.2.4.2	Hydrology and Hydraulic Investigation	20	100	30	60	40	50	300
3.2.4.3	Geotechnical Investigation	40	40	20	40	20	40	200
3.2.5	**Design and Cost of Restoration Project**		150		150		100	400
3.2.6	**Formulate and Assessment of Measures**	30	40	80	40	30	20	240
3.2.7	**Formulate Alternative Restoration Plans**	10	10	20	20	40	50	150
3.2.7.1	Cultural Resources			20	20	20	10	70
3.2.7.2	Engineering and Design Analysis			30	40	50	40	160
3.2.7.3	Real Estate Studies				10	20	20	50
3.2.7.4	Plan Formulation		20	80	70	40	70	280
3.2.8	**Prepare Watershed Management Plan**					110	90	200
3.2.9	**Initiate and Complete Environmental Process**			50	50	50	50	200
	SUBTOTAL	750	750	950	950	900	900	
	PHASE II TOTAL	**1,500**		**1,900**		**1,800**		**5,200**
TOTAL COST FOR PHASE I AND PHASE II								***6,650***

[1]All costs in thousands of dollars

Table 4. Resource Responsibility Matrix - Phase I Tasks

Task No.	Task Description	COUNCIL	STATE	CORPS
3.1.1	**Russian River Watershed Council Operations**			
3.1.1.1	Russian River Watershed Council Activities	30%	50%	20%
3.1.2	**Strategic Plan with Implementation Scope**			
3.1.2.1	Specify Tasks Associated with Watershed Restoration	60%	20%	20%
3.1.2.2	Develop Public Involvement Tools	40%	40%	20%
3.1.2	**Develop Russian River Watershed Restoration Information System**			
3.1.3.1	Information System	40%	40%	20%
3.1.3.2	Data Gap Analysis	50%	40%	10%
3.1.4	**Develop Restoration Project(s)**			
3.1.4.1	Investigate Modifications to Dam Outlet Structures and Modifications to Dam Operations/Management	30%	20%	50%
3.1.5	**Prepare Phase II Plan of Action**	30%	30%	40%
3.1.6	**Prepare Revised PSP**	10%	10%	80%

Table 5. Resource Responsibility Matrix – Phase II Tasks

Task No.	Task Description	COUNCIL	STATE	CORPS
3.2	**Plan of Action Implementation**			
3.2.1	**Watershed Council Operations and Public Involvement**	40%	40%	20%
3.2.2	**Coordination of Potential Projects**	40%	30%	30%
3.2.3	**Detailed Analysis of Restoration Tasks**	40%	30%	30%
3.2.3.1	Institutional Studies	20%	20%	60%
3.2.3.2	Environmental Studies	40%	30%	30%
3.2.3.3	Fish and Wildlife Studies	10%	10%	80%
3.2.3.4	Economic Studies	20%	40%	40%
3.2.3.5	HTRW Studies	20%	20%	60%
3.2.4	**Expand Information System**	40%	40%	20%
3.2.4.1	Surveying and Mapping	40%	40%	20%
3.2.4.2	Hydrology and Hydraulic Investigation	30%	30%	40%
3.2.4.3	Geotechnical Investigation	30%	30%	40%
3.2.5	**Design and Cost of Restoration Project**	10%	10%	80%
3.2.6	**Formulate and Assessment of Measures**	40%	30%	30%
3.2.7	**Formulate Alternative Restoration Plans**	40%	30%	30%
3.2.7.1	Cultural Resources	30%	30%	40%
3.2.7.2	Engineering and Design Analysis	30%	30%	40%
3.2.7.3	Real Estate Studies	20%	20%	60%
3.2.7.4	Plan Formulation	40%	30%	30%
3.2.8	**Prepare Watershed Management Plan**	50%	25%	25%
3.2.9	**Initiate and Complete Environmental Process**	20%	20%	60%

APPENDIX A

RELATED PROGRAMS

A.1 Habitat Inventory

California Department of Fish and Game Inland Fisheries Division is in the process of completing a Habitat Inventory using the protocols identified in California Salmonid Steam Habitat Restoration Manual, (Flosi and Reynolds), State of California Resources Agency, Department of Fish and Game, January 1998. This inventory utilizes protocols and database structures for anadromous salmonid resource assessment on the tributaries in the Russian River watershed. The following creeks have had some level of work completed:

Stream Surveyed	Distance in Feet	Year
Ackerman Creek	42,240	1994
Green Valley Creek	58,080	1994
Purrington Creek	19,008	1994
Willow Creek	36,432	1994
Big Austin (upper portion)	2,959	1994
Bear Pen Creek	16,361	1994
Atascadero Creek	50,160	1995
Jonive Creek	23,760	1995
Griffin Creek	15,840	1995
Mill Creek	81,523	1995

Stream Surveyed	Distance in Feet	Year
Little Briggs	16,368	1996
Coon	21,648	1996
Mill Stream	21,120	1996
McDonnel	22,176	1996
Blue Gum	10,560	1996
Ingalls	16,368	1996
Bear	16,368	1996
Mark West Creek	79,280	1996
Porter Creek	42,768	1996
Mill Creek	11,616	1996

Felta Creek	26,400	1995
Salt Creek	3,000	1995
Wallace	19,120	1995
Palmer	21,120	1995
Angel	5,413	1995
Freezeout Creek	6,834	1995
Alder Creek	14,054	1995
Robinson Creek	28,612	1995
Mohr Creek	10,580	1995
Sheephouse Creek	34,320	1996
Austin Creek	90,816	1996
Kidd Creek	37,488	1996
Ward Creek	53,328	1996
Big Oat	7,920	1996
Blue Jay	16,368	1996
Pole Mt.	20,592	1996
East Austin Creek	87,120	1996
Black Rock Creek	13,728	1996
Gilliam Creek	58,080	1996
Thompson Creek	10,560	1996
Gray Creek	33,264	1996
Devils Creek	23,760	1996
Conshea Creek	7,920	1996
Sulphur Creek	12,672	1996
Maacama Creek(Upper portion)	14,887	1996
Briggs	31,680	1996
Humbug Creek	11,616	1996
Windsor Creek	44,352	1996
Pool Creek	42,240	1996
Unnamed streams	211,200	1996
Maacama Creek (lower portion)	24,185	1997
Foote	25,872	1997
Franz	56,496	1997
Bidwell	22,176	1997
Porter Creek	33,264	1997
DutchBill	34,848	1997
Duvoul	6,865	1997
Grab	32,736	1997
Hulbert	3,696	1997
Mission	9,504	1997
Fife	27,894	1997
Redwood	7,392	1997
McNab	30,624	1997
Parsons	26,400	1997
Horse Hill	11,088	1997
Van Buren	10,032	1997
Weeks	9,504	1997
Pool	21,120	1997
Dead Horse	4,000	1997
Matanzas	59,136	1997
South Fork Matanzas	25,344	1997

TOTAL COMPLETED TO DATE **351 MILES**

Stream Surveyed	**Distance in Feet**	**Year**
Ackerman Creek	42,240	1994
Green Valley Creek	58,080	1994
Purrington Creek	19,008	1994
Willow Creek	36,432	1994
Big Austin (upper portion)	2,959	1994
Bear Pen Creek	16,361	1994
Atascadero Creek	50,160	1995
Jonive Creek	23,760	1995
Little Briggs	16,368	1996
Coon	21,648	1996
Mill Stream	21,120	1996
McDonnel	22,176	1996
Blue Gum	10,560	1996
Ingalls	16,368	1996
Bear	16,368	1996
Mark West Creek	79,280	1996

Griffin Creek	15,840	1995	Porter Creek	42,768	1996
Mill Creek	81,523	1995	Mill Creek	11,616	1996
Felta Creek	26,400	1995	Humbug Creek	11,616	1996
Salt Creek	3,000	1995	Windsor Creek	44,352	1996
Wallace	19,120	1995	Pool Creek	42,240	1996
Palmer	21,120	1995	Unnamed streams	211,200	1996
Angel	5,413	1995	Maacama Creek (lower portion)	24,185	1997
Freezeout Creek	6,834	1995	Foote	25,872	1997
Alder Creek	14,054	1995	Franz	56,496	1997
Robinson Creek	28,612	1995	Bidwell	22,176	1997
Mohr Creek	10,580	1995	Porter Creek	33,264	1997
Sheephouse Creek	34,320	1996	DutchBill	34,848	1997
Austin Creek	90,816	1996	Duvoul	6,865	1997
Kidd Creek	37,488	1996	Grab	32,736	1997
Ward Creek	53,328	1996	Hulbert	3,696	1997
Big Oat	7,920	1996	Mission	9,504	1997
Blue Jay	16,368	1996	Fife	27,894	1997
Pole Mt.	20,592	1996	Redwood	7,392	1997
East Austin Creek	87,120	1996	McNab	30,624	1997
Black Rock Creek	13,728	1996	Parsons	26,400	1997
Gilliam Creek	58,080	1996	Horse Hill	11,088	1997
Thompson Creek	10,560	1996	Van Buren	10,032	1997
Gray Creek	33,264	1996	Weeks	9,504	1997
Devils Creek	23,760	1996	Pool	21,120	1997
Conshea Creek	7,920	1996	Dead Horse	4,000	1997
Sulphur Creek	12,672	1996	Matanzas	59,136	1997
Maacama Creek(Upper portion)	14,887	1996	South Fork Matanzas	25,344	1997
Briggs	31,680	1996			

TOTAL COMPLETED TO DATE **351 MILES**

A.2 Watershed Restoration

California Senate Bill 271 provides money for watershed restoration. Several projects have been completed under these Habitat Restoration Grants including; Gill Creek Revegetation and Restoration, Santa Rosa Creek Road Assessment, Pale Mountain Creek Landslide Stabilization, Parsons Creek Barrier Improvement, Austin Creek Road Assessment Evaluation and Austin Creek Revegetation and Restoration.

A.3 Northwest Emergency Assistance Program

Northwest Emergency Assistance Program (NEAP) provided funding to employ fisherman and woman, who were displaced from their livelihoods and professions by a combination of factors affecting salmon, populations. Some of the work administered by the Resource Conservation District through NEAP includes; Green Valley Creek Riparian Restoration, Bishop's Ranch Creek Restoration, Salmon Creek Restoration Work, Russian River Tributary Inventory, Russian River Creel and Spawning Census, Freezeout Creek Riparian Fencing, Fuller Creek Road Assessment and Habitat Inventory, Walker Creek Restoration, and Salmon Creek Instream Restoration.

A.4 North Coast Basin Planning Project

The North Coast Basin Planning Project, developed by the California Department of Fish and Game, strives to enhance the status of anadromous salmonid populations through the implementation of the California's Salmon and Steelhead Restoration and Enhancement Program.

California's Salmon and Steelhead Restoration and Enhancement Program of 1988 (Chapter 1545/88) was created to enhance the status of anadromous salmonid populations and improve the fishing experience for Californians. The Russian River Salmon and Steelhead Trout Restoration Plan (CDFG 1991) stated that "protection of existing habitat and restoration of damaged habitat has to occur while the Russian River basin is developed for human populations if the intent of Chapter 1545/88 is to become a reality".

The focus of California Department of Fish and Game's program on the Russian is to develop and implement a salmon and steelhead restoration program. To achieve this goal, program staff are: 1) inventorying fish habitat in the Russian River basin and subbasins following standard methodologies discussed in the *California Salmonid Stream Habitat Restoration Manual* (Flosi and Reynolds, 1994); 2) identifying specific problem issues and sites stratified by sub-basin watershed; 3) prioritizing inventoried streams for restoration work; 3) building partnerships with local people and agencies to promote stewardship and assist with implementation.

A.5 Fish Friendly Farming and Volunteer Monitoring Program

The Resource Conservation Districts in the Russian River watershed are implementing a Fish Friendly Farming project to address the recovery of the federally-listed Coho Salmon and Steelhead trout by developing a certification program for grapegrowers who implement land management practices that restore and sustain fish habitat on their property. In addition, the Resource Conservation Districts are helping to maintain a sustainable river ecosystem by involving the public in watershed monitoring activities. This effort is being administered through a Volunteer

Monitoring Program, with the program goals of; (1.) further citizen education and awareness of watershed systems, (2.) collect data that can enable watershed stakeholders to develop sustainable management practices, and (3.) foster an understanding of how each individual is significant in maintaining a healthy watershed. The Sotoyome Resource Conservation District is in the process of forming five watershed groups by mid 1999. The Sotoyome Resource Conservation District will provide the watershed groups with the organization and workshop support, as well as a watershed newsletter and restoration implementation moneys as it becomes available.

A.6 Environmental Quality Incentive Program

Natural Resources Conservation Service has been funded to conduct an Environmental Quality Incentive Program (EQIP) for conservation work on dairies, rangeland, and cropland to benefit water quality (i.e.: nutrients or sediment), salmon habitat, bank stabilization, etc. in the Russian River watershed. The program provides cost-sharing assistance to install conservation practices to help solve: erosion problems, especially from roads, fish habitat and stream re-vegetation improvements, water and range conservation practice.

A.7 Small Community Flood Assessment

Small Community Flood Assessment, Russian River, CA Communities of Cloverdale, Healdsburg, Rio Dell, Hacienda, and Guerneville. The purpose of this study is to identify the local flood risk existing in each community and identify potential floodplain management solutions.

A.8 River Parkway Resource Enhancement, Public Access and Restoration Program

The Coastal Conservancy receives money from Proposition 204 for implementing River Parkway projects to enhance, improve access to, and restore resources. Projects along the Russian River have included access enhancement at Steelhead Beach, a Russian River Information Program, and the Gobbi Street Site Design. Seven other projects are scheduled for implementation in Sonoma and Mendocino Counties. Eligible projects include those that support the evaluation and prioritization of resources enhancement and restoration projects.

A.9 North Coast Regional Water Quality Control Board Watershed Planning

The Regional Water Board's watershed management approach is a sequential planning process that involves: 1) identifying water quality problems, issues, and concerns, 2) developing water quality goals associated with those problems, issues, and concerns, 3) prioritizing the goals so that efforts go to the most important goals first, 4) developing specific objectives and actions to address the goals, and 5) planning the actions based on current and expected funding on a 5-year planning horizon.

The process overall is conducted in the public arena, depending largely on input from local landowners, agencies, businesses, and special interest groups. The plan for action is a dynamic one, recognizing the ups and downs of funding and that other agencies or groups may address similar goals. As such, the plan is flexible and strives to reduce duplication of efforts while placing emphasis on priority activities with the highest likelihood of improving water quality. An important part of the plan is documenting what can and can not be done by the agency. Likewise, the documentation of the efforts and their relative success in improving water quality is a key element and provides feedback for future revisions of the plan.

The Regional Water Board first developed its action plan for the Russian River watershed some years ago, formalizing it in a regional watershed planning chapter in 1997 and 1998. That document and the plan are scheduled for review and revision by March of 1999. We will use the information derived from the Russian River Watershed Community Council over the last year in formulating changes to the plan. Review of the plan by the RRWCC and local agencies and interested parties will assist us in modifying the plan to current conditions, while still retaining the original focus on protecting and improving the anadromous fishery, drinking water quality, and recreational values of the Russian River.

A.10 Green Valley Creek Watershed Group

The Green Valley Creek Watershed Group was formed in 1994 with the involvement of the Sonoma County Planning Department to produce an enhancement program for the combined Atascadero Creek and Green Valley Creek Watersheds. The Group is currently headed up by the Goldridge Conservation Group and has implemented a number of creek enhancement projects with the assistance of DFG Inland Fisheries and the Sonoma County Water Agency.

Several landowners on Furlong Road have been concerned about Redwood Creek in light of increased residential development and decreasing well yields over the years. These landowners have been very active in assessing the condition of the watershed with the help of the Sonoma County Planning Department, Department of Fish and Game, and most recently the Sonoma County Health Department and the North Coast Regional Water Quality Control Board (Regional Water Board).

The Sonoma County Board of Supervisors requested that the Sonoma County Health Department form the Redwood Creek Task Force - an interagency task force charged with developing a preliminary assessment of yield, capacity, characteristics, and possible mitigations related to the apparent threat to adequate water supplies (both groundwater and surface water) within the Redwood Creek watershed.

A.11 Santa Rosa Creek Restoration

In 1993, the City of Santa Rosa, Sonoma County Water Agency, and County of Sonoma adopted the *Santa Rosa Creek Master Plan*, a planning document to preserve healthy portions of the

creek, restore damaged portions of the creek, and establish public use areas along the creek. The Prince Memorial Greenway is one of the first projects to be implemented and aimed towards meeting the goals of the *Santa Rosa Creek Master Plan*.

The Prince Memorial Greenway project is located in a section of creek near downtown Santa Rosa. This section of creek is relatively steep, trapezoidal channel, and is grouted and rip-rapped along the bottom and sides with little or no vegetation. The project elements include enhancing the ecological condition, habitat and diversity of the creek, restoring native vegetation and animal species, and developing a park along the creek.

A.12 Laguna Foundation

Incorporated October 29, 1990, in the State of California as a non-profit, public benefit corporation, it was initially created as the Laguna Advisory Committee by the Sebastopol City Council in November 1986. The Laguna de Santa Rosa Foundation received its final determination later as a 501(c)(3) organization from the Internal Revenue Service on May 17, 1995.

The specific purpose for incorporation, as stated in the Articles of Incorporation on file with the California Secretary of State Corporation Division, are:

- to educate members of the general public about the Laguna de Santa Rosa;
- to provide technical and background information to government agencies and other interested groups about the Laguna de Santa Rosa;
- to provide a forum for the expression of divergent views about the Laguna de Santa Rosa; and
- to conduct activities that investigate, preserve, restore or enhance the Laguna de Santa Rosa.

According to its bylaws, the Laguna Foundation is a non-membership organization, governed by a Board of Directors composed of no more than 15 members, elected yearly in January. The current board consists of 11 directors, two or whom have served since incorporation.

A.13 North Coast Regional Water Quality Control Board and Endangered Species in Russian River Watershed

North Coast Regional Water Quality Control Board has embarked on a project to: 1) conduct a review of the Regional Board's Water Quality Control Plan (Basin Plan), with an emphasis on the Russian River watershed, to determine whether existing water quality standards provide adequate protection for endangered fish species, and if not, propose recommendations which will increase protection of endangered fish species, 2) identify and prioritize watershed-wide projects which can enhance the quality of surface water and/or habitat within the Russian River watershed to benefit endangered fish species, 3) assist Sonoma County Water Agency with

Section 7 Consultation as it applies to water quality issues, and 4) coordinate the above activities with local, state, and federal or groups within the watershed.

A.14 Mendocino County Farm Bureau Watershed Planning Group

Mendocino County Farm Bureau established the state's first volunteer, landowner-controlled watershed working group to collectively participate in water quality management planning. Well-know and respected agriculturists in the watershed officially formed the group, supported by the Farm Bureau's professional staff from both the county and state. The group's watershed model identifies and evaluates water quality conditions of agricultural activities, informs and educates watershed property owners of alternative agricultural practices, maintains and enhances beneficial uses of water, monitors effective management approaches, and develops management plans for a spectrum of agricultural industries including dairy, field crops, forestry, and livestock grazing.

APPENDIX B

REFERENCE DOCUMENTS

ER 5-7-1 dtd 1 March 1991	*Project Management* Department of the Army regulation for the overall management of civil works projects.
ER 220-2-2 dtd 4 March 1988 33 CFR 230	*Procedures for Implementing NEPA* Department of Army regulation on environmental quality.
ER 405-1-12 (Ch. 12) dtd 28 May 1991	*Real Estate Handbook - Local Cooperation* Department of the Army regulation establishing guidelines for real estate activities for local cooperation agreements.
ER 1105-2-100 dtd 28 December 1990	*Planning Guidance* Department of the Army regulation on policy and guidance for the conduct of civil works planning studies.
ER 1110-2-1150	*Engineering and Design for Civil Works Projects as amended by CECW-EP, Subject: Engineering, Design and Dam Safety.*
EC 1105-2-210	*Ecosystem Restoration in the Civil Works Program*
EC 1110-2-263	*Civil Works Construction Cost Engineering* Department of the Army circular establishing accounting standards for preparing cost estimates for civil projects.
EC 1110-2-538	*Civil Works Project Cost Estimating - Code of Accounts* Department of the Army circular establishing accounting standards for preparing cost estimates for civil projects.
EM 1110-2-1301 dtd 10 March 1983	*Cost Estimates - Planning and Design Stages* U.S. Water Resources *Economic and Environmental Principles and Guidelines Council Publication for Water and Related Land Resources Implementation Studies*
EM 110-2-1913	*Design and Construction of Levees*
EM 1110-2-301	*Guidelines for landscape planting at floodwalls, levees, and embankment dams*

APPENDIX C

RUSSIAN RIVER WATERSHED
RESTORATION AND PROTECTION ISSUES

The following table was developed from the public participation during a series of meetings held by the Corps of Engineers and the State Resources Agency in August and September 1998 and from comment sheets completed by the attendees of the public meetings during that same time period. These issues will be reviewed, evaluated, and prioritized during the development of the watershed study and the completion of the watershed management plan.

Issues	Options for Addressing Issues
COUNCIL ISSUES ▪ Community based vs. government based projects ▪ Diversification of Council funding ▪ Lack of data ▪ Stewardship (both short-term and long-term) ▪ Studies should be action-oriented ▪ Use of existing data	Administrative support for council development activities.
DATA/RESEARCH ▪ Lack of data ▪ Use of existing data ▪ Compile data ▪ We need to take action – studies should support this	Master/Reference List Historical Records Upgrade mapping Aerial Photos Inventory wetlands (impact of agriculture and gravel mining) Inventory water rights and property ownership Monitor biological, social, economic activities and their effect on the river Administrative Support

Issues	Options for Addressing Issues
HABITAT PROTECTION ▪ Endangered Species Act – habitat protection ▪ Fish hatcheries ▪ Fisheries ▪ Flood plain ▪ Flow regimes ▪ Native habitat protection ▪ Riparian Habitat ▪ Seasonal to year round flow – restoration ▪ Section 7 and the Endangered Species Act ▪ Timber harvest ▪ Tributaries ▪ Use of streams as flood control channels ▪ Water quantity ▪ Water temperature ▪ Wildlife migration • Loss of biodiversity • Habitat fragmentation • Vegetation Conversion	Data gathering Mapping of land use patterns (Coastal Conservancy, Dept. of F&G, RCDs, NRCS, Sauhedrin Chapter of Native Plants Society, Circuit Riders, CA Resources Agency web site, etc.) Inventory - Aerial Photos Watershed analysis regarding floodplain function and riparian corridor restoration Water quality study (temperature, turbidity, etc.) Survey of exotic species Stop permit violations Administrative Support

Issues	Options for Addressing Issues
RESTORATION ▪ Community based vs. government based projects ▪ Economic analysis of the cost of restoration activities vs. the cost of preventative protection of the watershed (true costs) ▪ Interim steps to stop degradation ▪ Stewardship (both short-term and long-term) ▪ Use of existing data ▪ We need to take action – studies should support this ▪ Seasonal to year round flow – restoration ▪ Sediment and Erosion Control ▪ Remove Invasive species ▪ Tributary Restoration ▪ Riparian Habitat Restoration ▪ Bank & Channel Stability	Data gathering Mapping of natural resources and land use patterns (Coastal Conservancy, Dept. of F&G, RCDs, NRCS, Sauhedrin Chapter of native Plants Society, Circuit Riders, CA Resources Agency web site, etc. for working in progress) Identify areas which could be repaired/restored Aerial photo history Comprehensive channel cross sections (tributaries/mainstream field surveys) Sediment budget/sediment transport studies Define the effects of road dust Field survey including Russian River configuration, tributary access Weigh factors/authority to balance each parameter that impacts watershed resources Historic map review Study effects of dams and channelization Study alternative ways of using water Biological Survey – field survey and modeling Data Collection (temperature, diversion rates, sediment supply, fish passage problems) Flow Studies and Monitoring Administrative Support

Issues	Options for Addressing Issues
RECREATION/ACCESS ▪ Aesthetics ▪ Coyote dam ▪ Eel/Russian Potter Valley Project ▪ Fisheries ▪ Flow regimes ▪ Salmonid ▪ Trash used to stabilize banks ▪ Wastewater discharge ▪ Water quantity	Study effects of sport and commercial fishing Determine water quality impacts Administrative Support
STEELHEAD AND COHO ▪ Fish hatcheries ▪ Fisheries ▪ Native habitat protection ▪ Native species vs. exotic/ invasive/ non-native species ▪ Riparian Habitat ▪ Seasonal to year round flow – restoration ▪ Section 7 and the Endangered Species Act ▪ Water quantity ▪ Water temperature ▪ Wildlife migration	Data Gathering (area by area) Species Count Fish habitat studies Impact of predatory species (squaw fish) Use existing data Long-term monitoring Study effects of sport and commercial fishing Determine water quality impacts Dams impact Determine loss of habitat impacts Administrative Support
FLOOD REDUCTION ▪ Coyote dam ▪ Eel/Russian Potter Valley Project ▪ Flood control ▪ Flood plain ▪ Flow regimes ▪ Use of streams as flood control channels ▪ Water quantity	Field Survey Identify trouble spots Administrative Support

Issues	Options for Addressing Issues
DAM OPERATIONS ▪ Coyote dam ▪ Diversion ▪ Eel/Russian Potter Valley Project ▪ Fish hatcheries ▪ Fisheries ▪ Flood control ▪ Seasonal to year round flow – restoration ▪ Section 7 and the Endangered Species Act ▪ Water quantity ▪ Water temperature	Data Gathering Develop economic rebalance Effects on fish stability Bank stability Park Steiner proposal Aquifer Hydrograph (water needs assessment in real time) Map geomorphic changes Review anecdotal accounts Change flow regimes to lesson erosion and flooding and enhance native species Administrative Support
REGULATORY ISSUES ▪ Agriculture/Right-to-farm ▪ Development impacts ▪ Enforcement of existing regulations ▪ Flood plain ▪ Gravel mining ▪ Land use planning ▪ Property rights ▪ Regional compost facilities (minimum compliance vs. optimal operations)	Data Gathering Stop permit violations Regulatory reform and permit streamlining Timely Permit Process for Beneficial Uses Administrative Support

Issues	Options for Addressing Issues
ECONOMIC USES ▪ Agriculture/Right-to-farm ▪ Development impacts ▪ Gravel mining ▪ Property rights ▪ Restorative economy ▪ Timber harvest ▪ Water rights ▪ Economic analysis of the cost of restoration activities vs. the cost of preventative protection of the watershed (true costs)	Data Gathering Identify limits of the natural resources and parameters for their use Inventory water rights and property Monitor biological, social, economic activities and their effect on the river Develop economic rebalance Administrative Support
WATER SUPPLY ▪ Coyote dam ▪ Diversion ▪ Eel/Russian Potter Valley Project ▪ Flow regimes ▪ Infiltration and recharge ▪ Seasonal to year round flow – restoration ▪ Section 7 and the Endangered Species Act ▪ Water rights	Data Gathering Study effects of dams and channelization Study alternative ways of using water Biological Survey – field survey and modeling Stop permit violations Flow Studies and Monitoring Comprehensive channel cross sections (tributaries/mainstream field surveys) Sediment budget/sediment transport studies Administrative Support
WATER QUALITY ▪ Enforcement of existing regulations ▪ Erosion and sedimentation ▪ Regional compost facilities (minimum compliance vs. optimal operations) ▪ TMDL, esp. fast-tracking of the process ▪ Toxics ▪ Trash used to stabilize banks ▪ Wastewater discharge ▪ Water temperature	Data Collection (temperature, diversion rates, sediment supply, fish passage problems) Study alternative ways of using water Sediment budget/sediment transport studies Water quality study (temperature, turbidity, etc.) Field Survey (test toxic levels) Grey water for industrial use Increase treatment of discharge Administrative Support